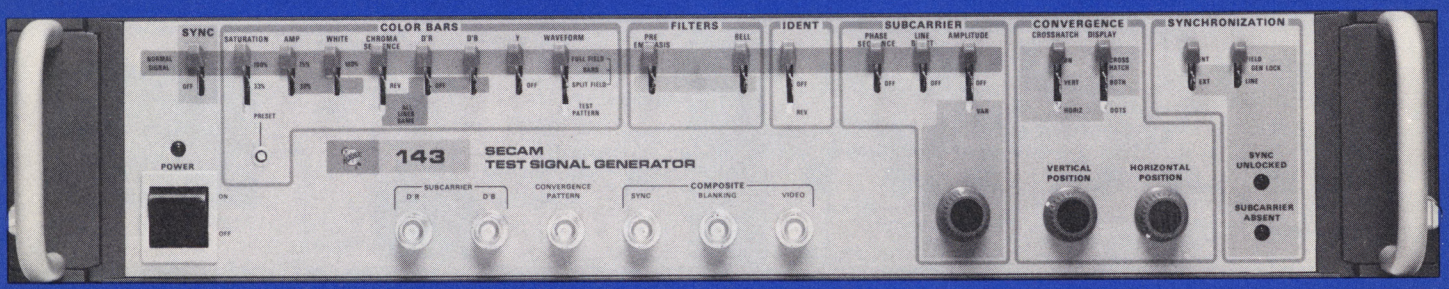
NEW 143 SECAM TEST SIGNAL GENERATOR



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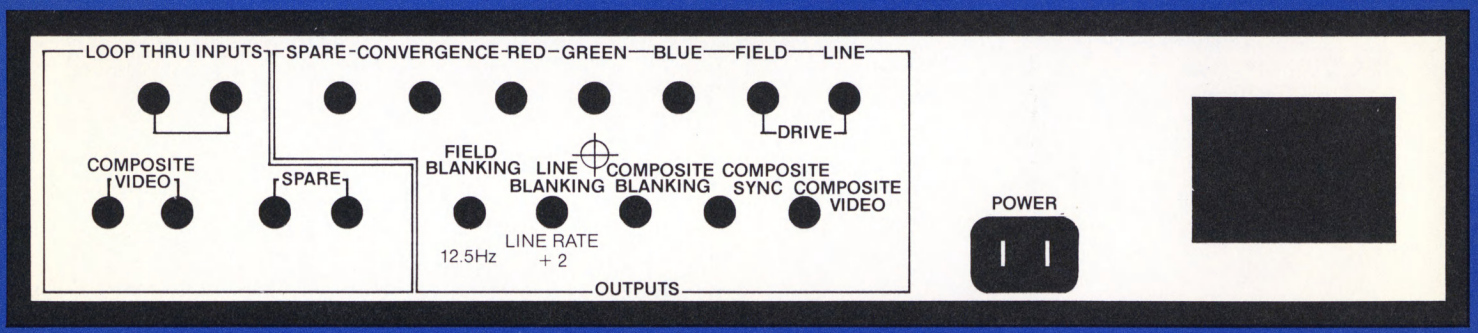
Rear panel.



Stand-alone broadcast-quality SECAM test signal generator

Will genlock to a SECAM composite video signal

Color bars, convergence pattern and RGB signals

Provisions for modifying test signal components

The TEKTRONIX 143 SECAM Test Signal Generator is a versatile source of all of the test and drive signals required to align and maintain SECAM television equipment. All test signal components and synchronization modes are easily controlled from the front panel thus providing the user with a versatile, easy-to-operate test signal package. Special internal programming provides additional test signal capability to satisfy unique testing requirements.

Test signals provided by the 143 are color bars, convergence pattern, and RGB signals. Color bars may be selected in either a full-field or split-field configuration. Saturation, amplitude, white level, and chroma sequence are all front panel controllable. The D'_R, D'_B, and Y signal components can be individually switched off by use of front panel controls.

The convergence pattern consists of positionable vertical and horizontal lines plus dots. All three signals are available in any combination.

RGB signals are available from three separate rear-panel outputs at all times and are not alterable from the front panel.

The 143 may be operated from its own internal standards or genlocked to a SECAM composite video signal. Color lock may be referenced to either the vertical identification signals or to the line burst. Front-panel LED's indicate the genlock status.

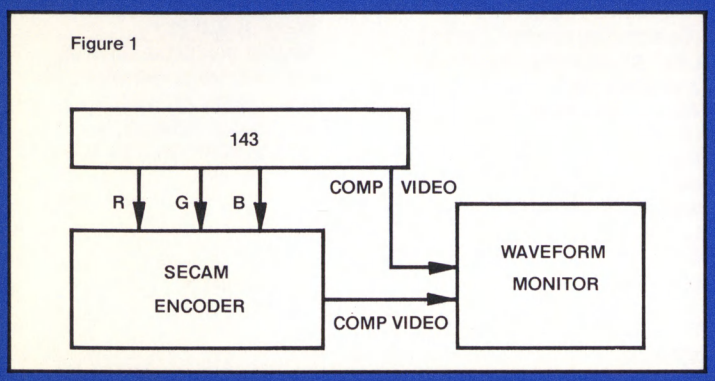
Sync and timing signals available include field drive, line drive, field blanking, line blanking, comp blanking, comp sync, a half line rate squarewave, and a 12.5 Hz squarewave.

DECODER & PICTURE MONITOR OPERATIONAL TESTS

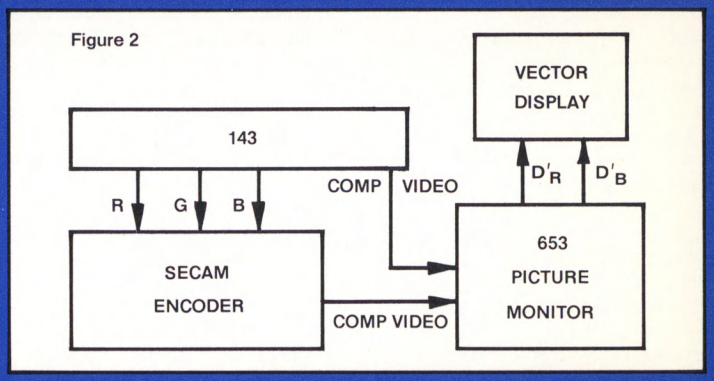
As a versatile source of high-quality test signals the 143 can be used for a number of operational tests. A few of those tests are described here to illustrate how the test signal control and modification capability of the 143 can be used.

Comparison of chrominance demodulation channels—An important step in insuring proper decoding of the SECAM video signal is the matching of the chrominance demodulation

Encoder luminance level and encoder subcarrier setup test configuration.



Encoder modulation linearity test configuration using the new TEKTRONIX 653 SECAM Color Monitor as a precision decoder.



channels. This will help eliminate hue errors in the decoded picture. With the 143 chroma sequence switch in the all-lines-same position and D'_R switched off, all lines of the active picture portion of the 143's composite video signal will contain the D'_B subcarrier modulated by the D'_B chrominance signal. This allows simultaneous comparison of the two chrominance demodulator channels in a decoder. With D'_R on and D'_B off all lines of the active picture portion of the composite video signal will contain the D'_R subcarrier modulated by the D'_R chrominance signal.

Chrominance sequence detection—The 143 is a useful tool in SECAM decoder design and maintenance since it has the ability to verify chrominance sequence detection based on either line burst or vertical identification signals.

The D'_R/D'_B sequence can be reversed by switching the chroma sequence control between its normal and reverse positions. The vertical identification signals can be reversed with respect to the D'_R/D'_B sequence present during the active picture by using the reverse position of the identification control.

Color-killer operation—Proper color-killer operation of color monitor decoders can be verified by deleting either the 143's line burst or vertical identification signals.

Checking and adjusting picture monitors—Proper adjustment of picture monitor linearity and convergence can be checked using the 143 convergence signal. Positionable vertical and horizontal lines plus dots may be selected in any combination.

ENCODER OPERATIONAL TESTS

Encoder luminance level setup—Proper setup of the encoder luminance levels will help insure correct saturation in the decoded picture. Use the RGB outputs of the 143 for your encoder inputs (Figure 1). Feed composite video from the encoder to input A of a Tektronix 1481 Waveform Monitor. Feed composite video from the 143, with D'_R and D'_B off, to input B of the 1481. Waveforms may now be compared.

Encoder subcarrier setup—Using the preceding setup, turn off Y and turn on $D'_R D'_B$. Compare the two waveforms.

Encoder modulation linearity—Verification of encoder modulation linearity is key part of encoder setup. Non-linear modulation can cause both hue and saturation shifts.

Use the RGB outputs of the 143 to drive the encoder (Figure 2). Feed the encoder into the A input of a Tektronix 653 SECAM Picture Monitor. The 653 provides D'_R and D'_B vectorscope drives which are fed into a 604 or 602 Vector Display Unit. Composite video from the 143 is fed into the input B of the 653. The 653 serves as a precision decoder whose inputs can be switched.

CHARACTERISTICS

GEN LOCK

SYNC AMPLITUDE—300 mV (negative going) within 6 dB.

SYNC ACQUISITION TIME—0.6 seconds.

D'_R-D'_B LOCK-UP LEVEL—Subcarrier amplitude +6 dB −18 dB of nominal.

D'_R-D'_B DROP-OUT LEVEL—Subcarrier amp. −18 dB of nominal.

D'_R-D'_B ACQUISITION TIME—100 lines (when referenced to line burst).

COMPOSITE VIDEO OUTPUT

SUBCARRIER SUPPRESSION AT BLANKING—>54 dB (Referenced to nominal subcarrier amplitude).

BELL FILTER—Center frequency: 4.286 MHz ±20 kHz.
Response: ±0.5 dB of theoretical (subcarrier amplitude ≤ nominal amplitude); ±2 dB of theoretical (subcarrier amplitude adjusted to be greater than nominal amplitude).
Off (front panel switch): Response flat ±1 dB 3.9 to 4.75 MHz.

RISETIME OF SUBCARRIER ENVELOPE AT BLANKING—400 ns ±100 ns.

CHROMINANCE—LUMINANCE TIMING—within ±50 ns.

LUMINANCE RISETIME—100 ns ±10 ns.

COLOR BAR COMPOSITE SIGNAL

AMPLITUDE—75% amplitude, 100% saturation with 100% white bar.

SUBCARRIER TOLERANCE—Frequency: ±(1.3% of deviation + 2 kHz). Amplitude: dependent on Bell Filter.

LUMINANCE AMPLITUDE—±1% or 1.5 mV, whichever is greater.

SYNC AND BLANKING

LINE FREQUENCY—15,625 Hz +1 Hz.

FIELD FREQUENCY—50 Hz.

FIELD SYNC—Equalizing pulse duration: 2.35 μs ±0.1 μs. Equalizing sequence duration: 2.5 lines. Synchronizing pulse duration: 27.3 μs ±0.2 μs. Synchronization sequence duration: 2.5 lines.
Synchronization rise time (10—90%): 0.2 μs ±0.1 μs.

LINE SYNC—Pulse duration: 4.7 μs ±0.2 μs.
Front porch: 1.5 μs ±0.3 μs.
Interval between sync leading edge & end of subcarrier blanking: 5.6 μs ±0.2 μs.
Line sync risetime (10-90%) 0.2 μs ±0.1 μs.

FIELD BLANKING—Duration 1.6 ms +(12 μs ±0.3 μs).

LINE BLANKING—Duration 12 μs ±0.3 μs.

OUTPUT SIGNALS

COMPOSITE VIDEO—Full-field color bars, split-field color bars, or test pattern.

PULSE OUTPUT AMPLITUDE SELECTION—composite sync, composite blanking, field blanking 12.5 Hz line blanking, line rate ÷ 2, field drive, and line drive are amplitude selected by a single internal jumper.

OUTPUT AMPLITUDE—1, 2, or 4 V negative going from ground.

COMPOSITE SYNC TIMING DETAIL—See Sync and Blanking.

COMPOSITE BLANKING—See Sync and Blanking.

FIELD BLANKING—See Sync and Blanking.
Alternative output: 12.5 Hz (Selected by internal jumper).

LINE BLANKING—See Sync and Blanking.
Alternative output: Line ÷ 2 (Selected by internal jumper).
Period: ½ cycle of squarewave per line, transition coincident with leading edge of line drive.
Levels: 0 V for D'_R, negative for D'_B.

LINE DRIVE—Duration: 7.15 μs ±0.15 μs.
Rise time (10-90%): 0.3 μs ±0.1 μs.

FIELD DRIVE—Duration: 704 μs ±30 μs.
Rise time (10-90%): 0.3 μs ±0.1 μs.

D'_R and D'_B SUBCARRIER—Approx. 1 V into 50Ω(for frequency counter).

RED-GREEN-BLUE OUTPUTS—Amplitude: 525 mV ±1%. Excep 700 mV for white bar.
Sync: −300 mV ±2% Green only (can be deleted with internal jumper).

CONVERGENCE—Pedestal: 0 volts.
Sync amplitude: −300 mV ±5%.
Peak luminance level: 525 mV ±5%.
Isolation: >40 dB.
Displays Available: Vertical lines, Horizontal lines, and/or dots in any combination. 7 x 9 or 15 x 20 line display selected by internal jumper.

POWER SUPPLY

MAINS VOLTAGE RANGE—115 VAC: 90 to 136 VAC. 230 VAC: 180 to 272 VAC.

MAXIMUM POWER CONSUMPTION—70 watts.

ORDERING INFORMATION

When ordering please use the exact nomenclature as given here:

143 SECAM Test Signal Generator (cabinet)

R143 SECAM Test Signal Generator (Rackmount)

Option 01 Miniquick connectors

DIMENSIONS AND WEIGHTS

CABINET (143)—Height: 3½ in, 8.9 cm; width: 16¾ in, 42.0 cm; depth: 18½ in, 47.1 cm; net weight: 17¾ lb; 8.0 kg.

RACK (143)—Height: 3½ in, 8.9 kg; width 19 in, 48.3 cm; depth 18½ in, 47.1 cm; net weight: 18½ lbs, 8.4 kg.